CLAIMS

The invention is claimed as follows:

1. An apparatus for exercising muscles of a body, the apparatus comprising a body suit including one or more non-stretch materials that are largely resistant to stretch and are interconnected to each other as well as affixed to one or more parts of the body to prevent sliding or slippage; and one or more stretch materials that can be stretched such that resistance is provided to stretching thereby creating a force of contraction that is retained for as long as the materials are stretched, wherein the non-stretch and stretch materials are connected and so configured and arranged to cause pulling on the body or part thereof to which the non-stretch material is connected thereby resulting in contraction of muscles connected to the body or part thereof allowing the muscles to resist the pulling and/or retain a normal anatomical position.

2. The apparatus of claim 1 wherein the contraction is performed at a low resistance and a low impact, and can be maintained for as long as the body suit is worn.

3. The apparatus of claim 1 wherein the non-stretch materials include a harness system that comprises one or more bands connected to one or more parts of the body including shoulders, chest, waist, thighs, and knees.

4. The apparatus of claim 3 wherein the harness system includes a plurality of harness bands that are interconnected with a similar material to further strengthen affixation to the body part and minimize slippage, and wherein the harness bands include at least one of a shoulder harness that is interconnected with a chest harness band, the chest harness being interconnected to a waist harness band, and the waist harness band, a thigh harness band and a knee harness band being interconnected.

5. The apparatus of claim 1 wherein the connection between the harness band and a non-stretch material including a resistance panel includes a zippered seam.

6. The apparatus of claim 1 wherein the connection between the harness band and a resistance panel includes a zippered seam that has a nonstretch border.

7. The apparatus of claim 1 wherein one or more muscle groups are subjected to a sufficient amount of tension that requires a higher degree of contraction than normal to maintain a useful normal body movement.

8. The apparatus of claim 1 wherein the body suit includes at least one of a breathable supplex Nylon (Dupont); Avalanche Lite®, and a nylon polyester mixture.

9. The apparatus of claim 1 wherein the body suit includes at least one of DF –2041 Tyvek Coated (Xymid, LLC Wear Force G (Xymid, LLC); Wear Force F!!(Xymid LLC); DF – 1562 (Xymid LLC); Lycra® Power; Polartec Stretch-Rx; Interface® B Stretch; Reflex^{tm}; Performax with stomatex®, Elcross®, and a similar composite stretch material with properties of wicking and breathing.

10. The apparatus of claim 1 wherein the body suit includes a design with at least one of a lamellar pattern, an accordion pattern, and a honeycomb pattern along each layer of a resistance material such that in a natural state a sum total material is compressed, but under stretch allows for stretch of about five time of a thickness thereof or more to provide increased resistance at joints throughout a range of motion.

11. The apparatus of claim 1 wherein the body suit includes a base material that is breathable and wickable and selected from the group consisting of Drytex 2000®, Microzone® (Louis Garneau); Dri-on with OFT® (Montbell); Coolmax® polyester; Coolmax® Ultracool RVU; Wickaways®; Malden Mills Bipolar 100; Tencel®' Ultrex®; Lycrapower®; Polyester/spandex of about 85/15 ratio; rayon and lcyra of about 85/15 ration; cotton and lycra.

12. The apparatus of claim 1 wherein the body suit can be worn optionally under outer clothing to allow for exercise during routine daily activity.

13. The apparatus of claim 1 wherein the body suit includes a top and shorts connected at a waist via at least one of a zippered seam and snaps.

14. The apparatus of claim 1 wherein one or more opposing muscle groups can be adjusted to one or more tension-nontension pairs to optimize muscular contraction of specific groups include an upper chest/upper back muscle group.

15. The apparatus of claim 1 wherein a force provided by a stretch/resistive material of the body suit and adjustable connections thereof ranges from about 2 lbs. to about 20 lbs.

16. The apparatus of claim 15 wherein the force provided by the stretch/resistive material and adjustable connections thereof ranges from about 4 lbs. about 14 lbs.

17. The apparatus of claim 15 wherein the force provided by the stretch/resistive material and adjustable connections thereof is about 10 lbs.

18. The apparatus of claim 4 wherein a material is used to bridge the connection from one side of a zippered seam's border to a harness band on another side by a fixed length of non-stretch or highly resistant stretch material being affixed to one border and stretched for a length that can be adjusted by a wearer of the body suit on the other side include via the harness band itself.

19. The apparatus of claim 4 wherein a bridging material takes tension off of a zippered seam to decrease wear and tear on its materials.

20. The apparatus of claim 4 wherein a bridging material allows a wearer to adjust the tension as desired and wherein a connection to the harness band be made by snaps including at least one of Snapet® sw, sx, sg; and Velcro.

21. The apparatus of claim 4 wherein a zippered seam can be a doubled zippered seam so that a wearer can set a tension to either high or low by zippering a bordering resistance panel on either high or low stretch.

22. The apparatus of claim 4 wherein the zippered seam allows for manufacture of the body suit as well as entry into the body suit at low tension.

23. The apparatus of claim 7 wherein a pair of zippered panels as well as a bridging material is affixed from one side and stretched over to the other for a degree of stretch adding tension onto a harness band to further allow custom fit and tension adjustment.

24. The apparatus of claim 7 wherein a harness band has an elastic section at one point and a bridging material over it allowing custom fit of the harness band and then adjustment to result in a snug but not uncomfortable affixed band around and to an affixed body part.

25. The apparatus of claim 7 wherein one or more resistance tubing or bands can be connected to the harness bands.

26. The apparatus of claim 21 wherein a series of adjustable snaps, zippered, or double-zippered seam on front and back, in addition to adjustable snaps on either side of the zippered seams allows for customizing maximal tension versus relaxation of opposing muscle group pairs including maintaining tension on upper chest muscles and relaxation of upper back muscles.

27. The apparatus of claim 21 wherein a resistance tubing or bands are affixed to a side harness along the side harness between a waist and knee at a distance

adjusted by a wearer of the body suit, then up along a side through a connecting short tube along a lateral side of an upper chest panel, across a short distance under an armpit to a similar short tube along an upper arm band on its medial side to a chest connecting tube; and down to an elbow harness along a medial side thereof.

28. The apparatus of claim 21 wherein a routine bipedal gait movement results in opposing movement of arms and legs to increase stretch on a resistance tubing or band and further increase muscle contraction and caloric expenditure.

29. The apparatus of claim 21 wherein a connection allows an option of the wearer to use the body suit under normal clothing.

30. The apparatus of claim 3 wherein optionally additional attachments of one or more harness bands below a knee or even to a foot allows for resistance to be applied to muscles of a leg in similar fashion.

31. An apparatus for applying circumferential tension on a rib cage, the apparatus comprising a chest compression band so configured and designed that is capable of providing a more complete exhalation with each expiration.

32. The apparatus of claim 31 wherein the chest compression and more complete exhalation result in increase in diaphragmatic breathing on inhalation.

33. The apparatus of claim 32 wherein a greater degree of inhalation and expansion of a lung including a lower lobes of the lung can result.

34. The apparatus of claim 32 wherein an increased air exchange can result in up to about 200 additional pints of air each day.

35. The apparatus of claim 32 wherein a typical shallow respiration of primarily rib cage breathing can become deeper, more efficient, and produce greater relaxation.

36. The apparatus of claim 32 wherein a greater quality of sleep results.

37. The apparatus of claim 32 wherein an average caloric expenditure breathing of about 900 calories per day via over 15,000 breaths per day is increased.

38. The apparatus of claim 32 wherein one or more muscles of respiration acquire improved strength and tone.

39. The apparatus of claim 32 wherein the chest compression band includes an elastic material.

40. The apparatus of claim 33 wherein one or more adjusting bands can be affixed including at least one of snapped and velcro'd at various distances to further adjust tension of the chest compression band.

41. The apparatus of claim 31 wherein a force of contraction ranges from about 1 lbs. to about 14 lbs.

42. The apparatus of claim 31 wherein a force of contraction ranges from about 2 lbs. to about 12 lbs.

43. The apparatus of claim 31 wherein a force of contraction is about 8 lbs.

44. An apparatus for improving posture by minimizing hunching forward of shoulders and effecting a pull backwards on the shoulders to a more erect position, the apparatus comprising a shoulder stabilizing band that connects non or minimal stretch material including a harness band affixed to the shoulders with another end on stretch so tension results with a connection affixed backwards to a back of a body or part thereof including a waist and chest that is capable of preventing slippage or sliding upwards.

45. The apparatus of claim 44 wherein a curvature of a back is improved by minimizing and/or preventing forward curvature and promoting a normal "s" curvature at and/or near a sacroiliac junction rather than a rounded convex curvature from forward slouching.

46. The apparatus of claim 44 wherein a pull backwards on the shoulders would result in a posture at a few degrees backwards of vertical thereby forcing one or more abdominal muscles to contract allowing exercise and strengthening with a low resistance low impact endurance form of exercise to maintain a vertical posture.

47. The apparatus of claim 44 wherein the pull backwards on the shoulders and resulting improved posture and abdominal muscular strength results in less spasm of the muscles of the lower back, and improved normal opposing muscle force within a lower back from the improved position of the lower spine.

48. An apparatus for improving a general health, fitness and well-being of an individual, the apparatus comprising a body suit including means for affixing resistance materials on stretch to various body parts to effect muscular contraction and increased oxygen consumption; means for increasing exhalation during each breathing cycle via chest compression to improve pulmonary fitness and 0_2 absorption; and means for improving posture, back curvature, and lower back strength by pulling minimizing hunching forward of the shoulders via one or more back stabilizer bands connecting the shoulders on tension backwards at the back of a body part including at least one of a waist and a chest thereby increasing abdominal tone to keep posture from going backwards of vertical.

49. The apparatus of claim 48 wherein a plurality of routine body movements, breaths with increased rib cage resistance to expansion and additional abdominal contractions to keep posture stabilized upon wear and use of the apparatus can result in increased caloric expenditure.

50. The apparatus of claim 48 wherein a basal metabolic rate can increase while wearing the body suit.

51. The apparatus of claim 48 wherein the body suit can be used for promoting an improved recovery from stroke or other neurologic impairment affecting muscular strength and/or coordination during routine daily activity.

52. The apparatus of claim 48 wherein the body suit can be used for improving health and fitness in a reduced gravity or gravity free environment.

53. The apparatus of claim 48 wherein weight loss can be increased during routine daily activity with the apparatus by increasing energy expenditure.

54. The apparatus of claim 48 wherein the body suit can provide an improved sleep quality and duration upon use of same.

55. The apparatus of claim 48 wherein the body suit can provide for an improved health and fitness during use in confined environments.

56. The apparatus of claim 48 wherein an overweight and/or unfit individual can obtain increased fitness levels without a specific exercise program other than wearing the body suit during daily activities provided a minimum level of routine, daily, normal body movement is maintained.

57. The apparatus of claim 48 wherein a "trap door" bottom is secured via at least one of zipper, snaps, Velcro® and other suitable fastening mechanism to simplify bathroom use without requiring suit removal or sliding off of the suit from the upper torso.